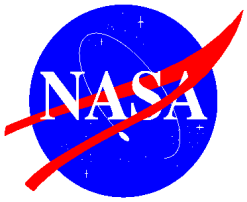

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ED27-SHK-FOP-003
BASELINE
2/20/2002

ED27 / VIBRATION, ACOUSTICS, AND SHOCK TEAM

FACILITY OPERATING PROCEDURE

NICOLET BE256LE CALIBRATION AND SOFTWARE VERIFICATION

CHECK THE MASTER LIST—
VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE

Document History Log

Status (Baseline / Revision / Canceled)	Document Revision	Document Date	Description
Baseline		2/20/2002	New Document

1. INTRODUCTION

1.1 Scope. This procedure defines the steps required to calibrate some Category V equipment used by the Pyrotechnic Shock Facility.

1.2 Purpose. This document defines calibration and software verification procedures as required by MPG 8730.5.

1.3 Applicability. This procedure applies to the NICOLET BE256LE data acquisition system and TEAM 256 software as it is used and as it interacts with FAMOS and SRSFAMOS analysis software.

2. DOCUEMENTS

2.1 Applicable Documents

ED27-OWI-M&V-002 Quality Records Control

ED27-SHK-SOP-002 Control of Quality Records in Pyrotechnic Shock

2.2 Reference Documents

MPG 8730.5 Control of Inspection, Measuring, and Test Equipment
Nicolet TEAM256 Operation Manual
FAMOS User's Manual
SRSFAMOS Operation Manual

3. DEFINITIONS

None

4. INSTRUCTIONS

To start the Nicolet BE256LE software double click the TEAM 256 Icon. Adjust the parameters to match the setup in figure 1, 2, and 3 below. During the calibration the Channel Configuration, "(2) Channel" and "(4) Input Span", will need to be reset to the values given in the appendix A tables.

TEAM 256 Timebase Configuration

(1)	Recorder Name	BE1
(2)	T. Mode	A
(3)	T. Source	Internal
(4)	A. Mode	Pre Trigger
(5)	A. # of Blocks	1
(6)	Pre Trigger	100 msec.
(7)	Segment A	500 msec.
(8)	Segment (Samp./sec.)	200k

Team 256 Trigger Configuration

(1)	Recorder Name	BE1
(2)	External	OFF
(3)	All Blocks	X
(4)	Mode	Basic
(5)	Source	CH_1

Figure 1

TEAM 256 Channel Configuration

(1)	Recorder Name	BE1
(2)	Channel	1
(3)	Channel Name	01
(4)	Input Span in Volts	0.4
(5)	Mid Scale	0
(6)	Filter	26.7% (53.4 kHz)
(7)	Enable Disk Storage	X
(8)	Value	0 + 1 * Volt
(9)	Technical Units	Volt
(10)	Coupling	DC
(11)	Mode	+ Input

Figure 2

The following calibration/software verification will be done once a year. The calibration portion, which excludes section 4.4, will be performed on a channel if it has been repaired or received maintenance. The calibration/verification will be performed when a software or hardware update is installed. Results will be noted on appendix A. Any out-of-tolerances will be adjusted or repaired before use and the procedure will be redone. Out-of-tolerance conditions will be dispositioned in accordance with ED27-

OWI-M&V-002. This procedure can be used to document post-test validation of test data, and the procedure may be modified to best validate the test data.

4.1 Record the information requested in appendix A for the system under calibration and the equipment used for calibration.

4.2 Set "(2) Channel" to the channel number being calibrated and record the channel, channel name, and card serial number in appendix A.

4.3 Set "(5) Input Span" to the value given in appendix A for each case. Apply the input signal given for each case listed and record the results in appendix A.

4.4 File Verification - If Needed

4.4.1 If file verification is needed, setup the TEAM 256 Display 1 as shown in figure 3.

TEAM 256 Channel Configuration

(8) Value 0 + 2000 * Volt
(9) Technical Units g's pk

TEAM 256 Display 1

Setup Sources

(1) Number of Traces 1
(2) 1 Nr Source name BE1
(3) Channel CH_1

Setup Cursors

(1) Set 1st cursor to ~0 msec.
(2) Set 2nd cursor to ~0.1 msec. for DC and 50 Hz.
(2) Set 2nd cursor to ~0.001 msec. for 10 kHz.

Figure 3

4.4.2 Set "(2)" for the appropriate 2nd cursor case given in Appendix A, "Software – File Verification".

4.4.3 Save the data for each case using the filenames "NVDT011", "NVDT021", and "NVDT031" [1] and the FAMOS file format in the Setup Export menu. Then select the Export! command from the menu to save the data.

4.4.4 Convert the saved data to the ".asc" file format using the verified FAMOS program. Print the ".asc" data by importing it to Excel and creating a plot.

4.4.5 Record the results in appendix A, "Software – File Verification". Repeat steps 4.4.2 to 4.4.5 for each case listed in appendix A, "Software – File Verification".

4.5 Record the "Performed by" and "Date" information in appendix A. Repeat steps 4.2 and 4.3 for each channel being calibrated and record results and information in "Appendix A - Continued".

5. NOTES

[1] NVDTXXY is the filename convention used for matching files between MAC/RAN, TEAM 256, SRSFAMOS, and FAMOS; and is as follows:

- NVD - is the 3 letter test designator (Neff or Nicolet Verification Data)
- T - is used to divide the filename for .SDF files
- XX - is the test number from 01 to 99
- Y - is the sequential number automatically given to data files as they are saved. The number is from 1 to 9.
- .SDF - is the filename designation for files in the MAC/RAN Standard Data Format
- .TXT - is the filename designation for ASCII data files saved in the TEAM 256 program.
- .ASC - is the filename designation for ASCII files converted from the FAMOS format.
- .DAT - is the FAMOS file format that is used to save the captured data in the TEAM 256 program.

6. QUALITY RECORDS

Appendix A will be completed for each of the channels calibrated/verified, and will be maintained as documented in ED27-SHK-SOP-002

Appendix A

Nicolet BE256LE System under Calibration - ECN _____

Voltmeter Brand, & Model _____
ECN _____ Calibration due date _____

Frequency Counter, Brand & Model _____
ECN _____ Calibration due date _____

Nicolet BE256LE channel ___, ch. name _____, & card serial number _____

CHANNEL CALIBRATION AND SOFTWARE VERIFICATION

Nicolet Input Span (Volt)	Freq. Input (Hz.)	Input Amplitude	Screen Freq. (mSec) Min.		Max.	Screen Amp. Min.		Max
0.4	DC	+100mV		_____		95mV	_____mV	105mV
0.8	DC	-200mV		_____		-210mV	_____mV	-190mV
1.2	DC	+500mV		_____		475mV	_____mV	525mV
1.2	DC	-500mV		_____		-525mV	_____mV	-475mV
1.2	DC	0 mV		_____		-5mV	_____mV	5mV
4.0	50	0.707 Vrms	21.0	_____	19.0	.95Vpk	_____Vpk	1.05Vpk
6.0	500	0.707 Vrms	2.10	_____	1.90	.95Vpk	_____Vpk	1.05Vpk
8.0	2500	0.707 Vrms	.421	_____	.381	.95Vpk	_____Vpk	1.05Vpk
10.0	10000	0.707 Vrms	.105	_____	.0952	.95Vpk	_____Vpk	1.05Vpk

Noise Floor at 0mVdc:_____ mVpk-pk. Tolerance <= 5mVpk-pk

Performed by _____ Date _____

SOFTWARE - FILE VERIFICATION

Nicolet BE256LE TEAM256 Software under Verification – Release _____
SRSFAMOS Software Version _____ Verification date _____
FAMOS Software Version _____ Verification date _____

Nicolet Input Span (Volt)	Freq. Input (Hz.)	Input Amplitude	File Freq. (mSec) Min.		Max.	File Amp. Min. (g's)		Max. (g's)
1.2	DC	0 mV		_____		-10	_____	10
4.0	50	0.707 Vrms	21.0	_____	19.0	1900 pk	_____ pk	2100 pk
10.0	10000	0.707 Vrms	.105	_____	.0952	1900 pk	_____ pk	2100 pk

Performed by _____ Date _____

Appendix A - Continued

Nicolet BE256LE channel ___, ch. name _____, & card serial number _____

CHANNEL CALIBRATION

Nicolet Input Span (Volt)	Freq. Input (Hz.)	Input Amplitude	Screen Freq. Min. (mSec)		Max.	Screen Amp. Min.		Max
0.4	DC	+100mV		_____		95mV	_____mV	105mV
0.8	DC	-200mV		_____		-210mV	_____mV	-190mV
1.2	DC	+500mV		_____		475mV	_____mV	525mV
1.2	DC	-500mV		_____		-525mV	_____mV	-475mV
1.2	DC	0 mV		_____		-5mV	_____mV	5mV
4.0	50	0.707 Vrms	21.0	_____	19.0	.95Vpk	_____Vpk	1.05Vpk
6.0	500	0.707 Vrms	2.10	_____	1.90	.95Vpk	_____Vpk	1.05Vpk
8.0	2500	0.707 Vrms	.421	_____	.381	.95Vpk	_____Vpk	1.05Vpk
10.0	10000	0.707 Vrms	.105	_____	.0952	.95Vpk	_____Vpk	1.05Vpk

Noise Floor at 0mVdc:_____ mVpk-pk. Tolerance <= 5mVpk-pk

Performed by _____ Date _____

Nicolet BE256LE channel ___, ch. name _____, & card serial number _____

CHANNEL CALIBRATION

Nicolet Input Span (Volt)	Freq. Input (Hz.)	Input Amplitude	Screen Freq. Min. (mSec)		Max.	Screen Amp. Min.		Max
0.4	DC	+100mV		_____		95mV	_____mV	105mV
0.8	DC	-200mV		_____		-210mV	_____mV	-190mV
1.2	DC	+500mV		_____		475mV	_____mV	525mV
1.2	DC	-500mV		_____		-525mV	_____mV	-475mV
1.2	DC	0 mV		_____		-5mV	_____mV	5mV
4.0	50	0.707 Vrms	21.0	_____	19.0	.95Vpk	_____Vpk	1.05Vpk
6.0	500	0.707 Vrms	2.10	_____	1.90	.95Vpk	_____Vpk	1.05Vpk
8.0	2500	0.707 Vrms	.421	_____	.381	.95Vpk	_____Vpk	1.05Vpk
10.0	10000	0.707 Vrms	.105	_____	.0952	.95Vpk	_____Vpk	1.05Vpk

Noise Floor at 0mVdc:_____ mVpk-pk. Tolerance <= 5mVpk-pk

Performed by _____ Date _____